Stevens Institute of Technology
Department of Electrical and Computer Engineering

Spring Semester 2025

CpE 462 Introduction to Image Processing

Homework 2: Due Feb. 13.

2.1 (1A) Prove the multiplication property of DTFT

$$x[n]y[n] \xleftrightarrow{\text{DTFT}} \frac{1}{2\pi}\int_{2\pi} X(e^{j\theta})Y(e^{j(\omega-\theta)})d\theta$$

2.2 (1C) Let **x[n]= δ[n]+2δ[n-1]-δ[n-2]+δ[n-3], h[n]= δ[n]+δ[n-1].** If **y[n]=x[n]*h[n],** calculate the DTFT of **y[n]. (**Hint: use convolution property of DTFT.)

2.3 (3B) Capture, display and printout an image using Matlab.